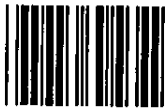

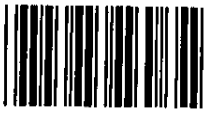

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3:00-CV-00701 GAMMA METRICS INC V. ANALYSER SYSTEMS

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UNITED STATES DISTRICT COURT

SOUTHERN DISTRICT OF CALIFORNIA

GAMMA-METRICS, INC.,

Plaintiff,

v.

ANALYSER SYSTEMS, COMPANY, INC.,

Defendant.

Civil No. 00cv0701-L(LAB)

ORDER DENYING ASYS'S MOTION FOR SUMMARY JUDGMENT ON INVALIDITY (35 U.S.C. § 112 ¶ 6.)

[Docket No. 61]

This matter came on regularly for a hearing on Defendant Analyser Systems Company, Inc.'s ("ASYS") motion for summary judgment on invalidity of the '043 patent for failure to disclose best mode under 35 U.S.C. § 112 ¶ 6. Juanita Brooks of Fish and Richardson appeared for Plaintiff Gamma-Metrics, Inc. ("Gamma-Metrics"), and Richard Warburg, Stephen Korniczky, and Eleanor Musick of Brobeck, Phleger & Harrison, LLP appeared for ASYS.

FACTUAL BACKGROUND

I. Plaintiff Gamma-Metrics and the '043 Patent.

Plaintiff Gamma-Metrics is a San Diego-based company that designs, manufactures, and markets instruments used for the analysis of bulk materials such as coal, minerals, and the raw materials used in cement. From about 1985, Gamma-Metrics began developing products using a measurement technique called prompt gamma neutron activation analysis ("PGNAA"). PGNAA

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is based on a subatomic reaction between a neutron and an atomic nucleus. In PGNAA, the bulk material, such as a stream of cement raw materials on a moving conveyor belt, is exposed to slow (or "thermalized") neutrons originating from a radioactive source. When a thermal neutron moves close enough to the nucleus of an element in the sample, the nucleus absorbs the neutron and becomes energetically excited. After absorbing a thermal neutron, the nucleus quickly returns to the unexcited state by the nearly instantaneous (or "prompt") release of one or more gamma rays.

Each element responds differently to the neutron-activation process in two ways. First, each element has its own characteristic ability to absorb (or "capture") thermal neutrons, measured by the element's "capture cross-section." Second, after absorbing a thermal neutron, each element emits a unique set of gamma-ray energies with known probability. By measuring the energy of gamma rays emitted when a raw material sample is exposed to thermal neutrons, it is possible to identify the elements present in the sample (or at least those with appropriate capture cross-sections that emit measurable gamma rays).

In 1990, Gamma-Metrics was competing with MDH Industries for the sale of a PGNAA coal analyzer. At the time, Gamma-Metrics became aware of several U.S. patents issued to MDH founder J. Howard Marshall III ("Marshall") that seemed to cover the PGNAA techniques used in Gamma-Metrics' analyzers. One of these patents was United States Patent No. 4,682,043 by Marshall entitled, "Obtaining Uniformity of Response in Analytical Measurement in a Neutron-Capture-Based On-Line Bulk-Substance Elemental-Analyzer Apparatus" ("the '043 patent") Gamma-Metrics eventually purchased all of MDH's assets relating to the "Elan" line of bulk-material analyzers, including the '043 patent. All right, title, and interest in the '043 patent was assigned to Gamma-Metrics on February 11, 1991.

Claim 4 of the '043 patent reads:

> An improved apparatus for the on-line analysis of the composition of a bulk substance flowing through a measurement volume, wherein said analysis includes the production and capture of neutrons and the detection of the resulting capture gamma rays, said apparatus comprising, in combination:
>
> (a) means for containing the bulk substance to be analyzed, said means comprising an elongated passageway adapted to contain said bulk substance as it flows through said apparatus, said passageway

> being at least partly surrounded by a neutron-reflecting substance;
> (b) neutron-producing means for providing neutrons which generate gamma rays by neutron-capture reactions with the nuclei in the bulk substance being analyzed, said neutron-producing means comprising at least one neutron source located externally of said passageway; [and]
> (c) means for gamma-ray detection operably associated with the neutron-producing means and the means for containing the bulk substance being analyzed, the means for gamma-ray detection producing electric signals indicative of the gamma-ray energies to provide for the measurement of the energy spectrum of the capture gamma rays, said means comprising at least one gamma-ray detector disposed externally of said passageway.

('043 patent col. 10, lines 23-49.)

After obtaining the '043 patent and MDH's assets, beginning in 1991 Gamma-Metrics began applying its experience with PGNAA to develop a new-generation analyzer for the analysis of bulk raw materials used in cement manufacturing. Gamma-Metrics' previous PGNAA instruments used a chute-based design, where bulk material dropped through a vertical chute between a pair of neutron sources adjacent to one side of the chute and sodium iodide detectors adjacent to the opposite side of the chute. Gamma-Metrics' new-generation analyzer, the CrossBelt Analyzer ("CBA"), was designed to analyze material on the conveyor belt and measure elemental composition of material loaded on the belt without requiring the customer to cut its conveyors or install sampling towers. This configuration, however, results in an increased sample variation across the measurement volume, so the reduction of sensitivity variations took on heightened importance for the CBA. To ensure adequate uniformity, the CBA incorporates the improvements recited in claim 4 of the '043 patent. Gamma-Metrics sold the first CBA in 1993.

II. The *Scantech* Action and Reexamination Proceedings.

In 1996, an Australian company called Mineral Control Instrumentation, Ltd. ("MCI") introduced a product called the Geoscan. In 1997, Gamma-Metrics filed a patent infringement action against MCI and Scantech, MCI's Australian parent company, before this Court and entitled, *Gamma-Metrics v. Scantech*, 97cv1767-L(LAB). On May 20, 1998, Judge Huff issued an order finding that Geoscan infringed claims 4, 5, and 6 of the '043 patent. Scantech and MCI

then instituted a reexamination proceeding at the U.S. Patent and Trademark Office ("PTO").[1] Scantech and MCI's reexamination request included four prior-art references that they claimed created new questions of patentability. The Patent Office concluded that one of the references raised questions warranting reexamination. At the end of June, 2000 the PTO issued a reexamination certificate confirming the patentability of all of the '043 patent's claims.

In an order dated December 10, 1998, Judge Huff denied the parties' two cross-motions for summary judgment regarding validity of the '043 patent. In the first cross-motion, the Defendants argued that claims 4 and 5 are anticipated by two references in the prior art, the Progress publication and the Gozani publication. With respect to anticipation by the Gozani publication, Judge Huff found that the Scantech defendants had not shown invalidity by clear and convincing evidence, but that there were disputed questions of fact. Thus, even though Judge Huff recognized that the presumption of patent validity remained intact, a grant of summary judgment was not appropriate for either party. Similarly, Judge Huff found that the Scantech defendants had not met their burden in showing by clear and convincing evidence that the Progress publication anticipated the '043 patent, but was also not willing to grant summary judgment for validity in favor of Gamma-Metrics. The Scantech defendants had also moved for summary judgment arguing that the '043 patent violated 35 U.S.C. § 112, which requires that a patent specification set forth in clear and concise terms a written description of the invention, of the manner and process of making and using, and the best mode contemplated by the inventor of carrying out his invention. Judge Huff found that there were a "plethora of material facts that [were] very much in dispute" and that although the presumption of validity still stands, the Scantech defendants had raised issues of material fact that precluded the Court from granting summary judgment in favor of Gamma-Metrics.

In the second cross-motion for summary judgment, the Scantech defendants contended that claims 4 and 6 are anticipated by U.S. Patent 3,283,545 ("Bartko '545 patent") and rendered

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[1] A reexamination proceeding is an administrative proceeding through which any person can ask the Patent Office to reconsider an issued patent in light of "new questions of patentability" raised by prior-art references that were not previously considered by the patent examiner. 35 U.S.C. §§ 302-07.

obvious by a variety of publications. Again, Judge Huff found that although the Scantech defendants had not made a clear and convincing showing of invalidity, there were many questions of disputed fact that precluded the Court from granting summary judgment of validity in favor of Gamma-Metrics. In sum, Judge Huff denied both cross-motions for summary judgment.

The *Scantech* action has settled.

III. Defendant Analyser Systems.

Defendant Analyser Systems ("ASYS") is a small, four-employee company that has been making, using, and selling analyzers since 1997. Gamma-Metrics contends ASYS's product that is marketed under the names "Full Stream Analyzer," "Full Stream Elemental Analyzer," or "FSA" infringes the '043 patent. ASYS sold its first analyzer in 1998, and has competed with Gamma-Metrics for numerous cement-analyzer sales. ASYS describes the FSA as "a Prompt Gamma Neutron Activation analyzer" "designed for continuous operation in ore, rock processing, coal and other mineral industries, analyzing chemical elemental composition of process streams traveling through the analyzer on a standard conveyor belts."

DISCUSSION

In this motion, ASYS argues the '043 Patent is invalid for failure to disclose best mode under 35 U.S.C. § 112 ¶ 6. Specifically, ASYS contends that Marshall failed to disclose the best mode for the sensor electronics component and that this component should perform the function of avoiding pulse-pileup in order to obtain accurate and sensitive measurements of sample compositions. ASYS next argues that the '043 patent is invalid for failing to disclose the best mode for the neutron-reflecting substance is to use bismuth of certain dimensions. While Gamma-Metrics does not dispute that neutron reflectors are subject to the best mode requirement, it argues that sensor electronics are not part of the claimed invention and therefore it was not necessary for Marshall to disclose their best mode. Gamma-Metrics further responds there are triable issues of material fact as to whether Marshall conceived of a best mode for either sensor electronics or neutron reflectors, or whether a person skilled in the art would have known how to practice the best mode of the '043 invention.

I. Applicable Law Regarding Summary Judgment Motions

Under Federal Rule of Civil Procedure 56, the Court can grant summary judgment when, based on the record, no genuine issue of material fact exists and the moving party is entitled to judgment as a matter of law. Fed. R. Civ. P. 56. A genuine issue of material fact exists where the evidence is such that a reasonable jury could find in favor of the nonmoving party. *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 248 (1986). A fact is material when it affects the outcome of the case. *Id.*

II. Applicable Law Regarding Patent Validity and Best Mode.

A patent enjoys a statutory presumption of validity. 35 U.S.C. § 282. This presumption "is based in part on the expertise of patent examiners presumed to have done their job." *Brooktree Corp. v. Advanced Micro Devices, Inc.*, 977 F.2d 1555, 1574 (Fed. Cir. 1992). Thus, the party asserting invalidity of a patent bears the burden of proving invalidity by clear and convincing evidence. 35 U.S.C. § 282; *United States v. Telectronics, Inc.*, 857 F.2d 778, 785 (Fed. Cir. 1988).

Section 112 of Title 35 of the United States Codes requires that a patent specification "contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, *and shall set forth the best mode contemplated by the inventor of carrying out his invention.*" 35 U.S.C. § 112 (emphasis added). The emphasized language is known as the "best mode" requirement. This requirement "creates a statutory bargained-for-exchange by which a patentee obtains the right to exclude others from practicing the claimed invention for a certain time period, and the public receives knowledge of the preferred embodiments for practicing the claimed invention." *Eli Lilly & Co. v. Barr Labs, Inc.*, 222 F.3d 973, 980 (Fed. Cir. 2000); *see Dana Corp. v. IPC Ltd. Partnership*, 860 F.2d 415, 418 (Fed. Cir. 1988) (stating that the purpose of the best mode requirement "is to ensure that the public, in exchange for the rights given the inventor under the patent laws, obtains from the inventor a full disclosure of the preferred embodiment of the invention.") Noncompliance "with the best mode requirement amounts to concealing the

preferred mode contemplated by the applicant at the time of filing." *DeGeorge v. Bernier*, 768 F.2d 1318, 1324 (Fed. Cir. 1985); *Sure Safe Inc. v. C&R Pier Mfg.*, 832 F. Supp. 293, 295 (S.D. Cal. 1993). The party arguing that a patent fails to meet the best mode requirement must prove this defense by clear and convincing evidence. *Engel Indus., Inc. v. Lockformer Co.*, 946 F.2d 1528, 1531 (Fed. Cir. 1991).

Whether a patent meets the best mode requirement is a question of fact. *Northern Telecom Ltd. v. Samsung Electronics Co.*, 215 F.3d 1281, 1286 (Fed. Cir. 2000); *Engel*, 946 F.2d at 1531. Compliance with the best mode requirement is determined by a two-part test: First, the Court looks at "whether, at the time of filing the patent application, the inventor considered a particular mode of practicing his invention superior to all other modes." *Northern Telecom*, 215 F.3d at 1286; *Eli Lilly*, 222 F.3d at 980. The Federal Circuit has stated this inquiry is "wholly subjective; that is, it focuses on the inventor's state of mind at the time he filed his patent application." *Northern Telecom*, 215 F.3d at 1286; *Eli Lilly*, 222 F.3d at 981. The second prong is "whether the inventor's disclosure is adequate to enable one of ordinary skill in the art to practice the best mode of the invention." *Northern Telecom*, 215 F.3d at 1286; *Eli Lilly*, 222 F.3d at 981. In contrast to the first inquiry, the second part of the best mode test is "objective and depends upon the scope of the claimed invention and the level of skill in the relevant art." *Northern Telecom*, 215 F.3d at 1286; *Eli Lilly*, 222 F.3d at 981.

In *Engel*, the Federal Circuit stated that "[t]he best mode inquiry is directed to what the applicant regards as the invention, which in turn is measured by the claims. Unclaimed subject matter is not subject to the disclosure requirements of § 112." *Engel*, 946 F.2d at 1531; *accord, Eli Lilly*, 222 F.3d at 981 (stating that "an inventor need not disclose a mode for obtaining unclaimed subject matter unless the subject matter is novel and essential for carrying out the best mode of the invention."). The reasons for this rule "are pragmatic: the disclosure would be boundless, and the pitfalls endless." *Engel*, 946 F.2d at 1531. In addition, the inventor need not disclose the best mode for production details or routine details. *Eli Lilly*, 222 F.3d at 981. Accordingly, the first task in analyzing whether the best mode requirement is met is to define the

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invention at hand: this is "a legal exercise, wherein the ordinary principles of claim construction apply." *Northern Telecom*, 215 F.3d at 1286-87.

When there is conflicting evidence on whether a specification provides adequate information to allow those skilled in the art to practice the inventor's contemplated best mode, the adequacy of the disclosure represents a genuine issue of material fact that precludes summary judgment. *Transco Prods., Inc. v. Performance Contracting, Inc.*, 38 F.3d 551, 561-62 (Fed. Cir. 1994).

III. Sensor Electronics.

A. Whether Sensor Electronics are Subject to the Best Mode Requirement.

An initial matter that must be determined is whether sensor electronics are subject to the best mode requirement. Gamma-Metrics contends that the claimed invention in claim 4(c) of the '043 patent does not claim sensor electronics; rather, the patent is for a subassembly of an analyzer. Gamma-Metrics contends that proper construction of claim 4(c) of the '043 patent shows it is not a "means-plus-function" claim (as Judge Huff ruled in the *Scantech* action) and that even if it so interpreted, it does not include sensor electronics as part of the claimed invention. ASYS in turn responds that it is unnecessary for the Court to construe claim 4(c) before ruling on ASYS's motion, because sensor electronics to operate an analyzer capable of analyzing the composition of bulk substances and therefore sensor electronics is subject to the best mode requirement. The Court agrees with ASYS.

Federal Circuit law establishes that unclaimed elements are subject to the best mode analysis if they are necessary to practice the invention. For example, in *Dana*, the Federal Circuit found that failure to disclose an unclaimed fluoride treatment that was necessary for satisfactory performance of the claimed seal violated the best mode requirement. *Dana*, 860 F.2d at 419; *see Northern Telecom*, 215 F.3d at 1288 (discussing *Dana*). Also, in *Northern Telecom v. Datapoint Corp. (Datapoint)*, 908 F.2d 931 (Fed. Cir. 1990), the Federal Circuit held that the patentee's failure to disclose special audio tapes for capturing data, which the inventors preferred to conventional audio cassettes, was a violation of the best mode requirement, where the claim included the use of magnetic tapes. *Datapoint*, 908 F.2d at 940; *see Northern*

Telecom, 215 F.3d at 1288 (discussing *Datapoint*). Also, in *Robotic Vision Sys., Inc. v. View Eng'g, Inc.*, the Federal Circuit stated that even though the claimed method of obtaining three-dimensional data from certain devices did not recite the use of a computer and software, "the fact that the use of software or a computer is not mentioned in the claims of the Robotic patent does not, contrary to Robotic's argument, exempt such use from the requirements of a best mode disclosure, since carrying out the invention usually involves more than what is expressly claimed." 112 F.3d 1163, 1166 (Fed. Cir. 1999).

In this case, the evidence shows that sensor electronics are necessary for carrying out the best mode of the '043 patent's invention. The patent claims an analyzer to measure the composition of bulk materials. ('043 patent claims 1, 4; '043 patent reexamination certificate claims 1, 4, 9.) As described in the patent, neutron sources in the analyzer bombard bulk samples with neutrons as the sample passes through the measurement area. ('043 patent claims 1, 4; '043 patent reexamination certificate claims 1, 4, 9.) Some of the neutrons interact with, or are captured by, atoms in the sample to produce prompt gamma rays whose energies and intensities depend on the type of atom with which the neutron interacted. ('043 patent, col. 2, line 60-col. 3, line 6.) The specification states that sensor electronics are what detect and convert electrical signals from the gamma ray detectors into digital information that can be used to measure the energies and intensities of the gamma rays:

> When the gamma rays interact in the gamma-ray detector 24, they produce electrical signals indicative of their energy. The sensor electronics 26 convert these electrical signals into digital information, which is transmitted over an interconnecting cable 28 to the display console 30. The display console 30 processes this information using the fact that neutron capture produces an energy [specturm] *spectrum* which depends on the amounts of the various elements capturing the neutrons. The result of this processing is information concerning the relative concentrations of the various elements of interest in the measurement volume 18 and any other properties, such as density, which may be usefully obtained from the measured spectrum.

('043 patent, col. 9, lines 29-42; '043 patent reexamination certificate, col. 3, lines 25-37.)

At his deposition, Marshall testified that without the sensor electronics, the analyzer would not obtain any results and would be inoperative. (Marshall Depo. 10:15-11:22) Marshall admitted that sensor electronics are "essential for making a bulk analyzer work," and stated "I think electronics are important to these devices. There would be no way to process the signal if

you had no electronics." (Marshall Depo. 10:21-23, 11:21-22; *see also* Marshall Depo. 11:2-4 ("Well, I think what I said, if you have no electronics there would be no way to get a result from the instrument.").)

ASYS maintains that because Marshall and his attorneys argued to the PTO that Marshall's work on the sensor electronics constituted part of his diligence in working on the analyzer claimed in the '043 patent, Gamma-Metrics cannot now argue that the sensor electronics is not a necessary component of the claimed analyzer even though the claims of the '043 patent do not explicitly name the "sensor electronics" component. In support of its position, at oral argument ASYS referred the Court to the recent Federal Circuit decision, *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 234 F.3d 558 (Fed. Cir. 2000). That case concerned the effect changes made to claims during prosecution would have on the application of the doctrine of equivalents. *Festo* held that when a claim amendment creates prosecution history estoppel regarding a claim element, there is no range of equivalents available for the amended claim element. *Festo*, 234 F.3d at 569. In other words, application of the doctrine of equivalents to that claim element is completely barred, "regardless of whether the amendment is explained or unexplained, if the amendment narrows the scope of the claim for a reason related to patentability." *Id.* at 576. In so holding, *Festo* stated that "[t]he logic of prosecution history estoppel is that the patentee, during prosecution, has created a record that fairly notifies the public that the patentee has surrendered the right to claim particular matter as within the reach of the patent. *Id.* at 564-65. ASYS contends that Marshall's arguments and declarations during the reexamination proceedings serve this notice function and preclude Gamma-Metrics from now arguing that sensor electronics are not part of the claimed invention.

Marshall and his attorneys represented to the PTO that Marshall had exercised diligence in working on the analyzer claimed in the '043 patent from the time he had a clear and definite idea of the invention, and submitted notebook pages and designs relating to his work on the sensor electronics component of the analyzer. Specifically, during the reexamination proceedings for the '043 patent, the Examiner asserted that the claims of the '043 patent were not new and were obvious (and therefore unpatentable), in view of a 1977 publication by

Gozani, *et al.* ('043 Reexamination File History Lodged with the Court as Exhibit 2 on August 7, 2000 ("'043 File History") at 000425-38, 000706-13.) In order to overcome that reference, Marshall contended that the Gozani article could not be used as a basis for establishing the unpatentability of the claimed analyzer because Marshall had conceived of his invention prior to the publication date of Gozani *et al.* and Marshall had diligently worked on the analyzer up until the filing of the '043 patent. ('043 File History 000448, 000485, 000487.) Specifically, during reexamination Gamma-Metrics represented to the PTO that work on the sensor electronics helped establish Marshall's diligence in "reducing to practice" the invention claimed in the '043 patent. ASYS states that the PTO accepted these representations in issuing the reexamination certificate, noting that key prior art was "overcome" based on Marshall's earlier invention date and diligence. ('043 File History at 001124.)

At his deposition, Marshall was questioned regarding his diligence in the reduction to practice of the invention:

> Q. And so why was it, why do you believe you were acting in a diligent fashion to reduce the inventions as described in the '043 [patent] to practice by working on the sensor electronics?
>
> A. Well, because the sensor electronics was a piece of the overall instrument.
>
> Q. In fact without it you wouldn't be able to get a reading?
>
> A. Well, you need some kind of electronics to process these signals, yes.
>
> Q. So it was basically essential to be able to get the PGNAA devices as described in the '043 patent to work?
>
> A. Electronics is necessary for this kind of instrument.

(Marshall Depo. 20:21-21:10.)

As discussed above, Federal Circuit cases establish that unclaimed subject matter necessary for carrying out the best mode of an invention is subject to the best mode requirement. *Northern Telecom*, 215 F.3d at 1288; *Datapoint*, 908 F.2d at 940; *Dana Corp.*, 860 F.2d at 419. As the Federal Circuit noted in *Chemcast Corp. v. Arco Indus. Corp.*, "[i]ndeed, most of the cases in which we have said that the best mode requirement was violated addressed situations where an inventor failed to disclose non-claimed elements that were nevertheless necessary to

practice the best mode of carrying out the claimed invention." 913 F.2d 923, 928 (Fed. Cir. 1990). The Court finds that the evidence presented establishes that regardless of whether sensor electronics are part of claim 4(c), they are necessary and related and to the analyzer claimed in the '043 patent invention. Accordingly, the Court finds that sensor electronics are subject to the best mode requirement.

B. Whether the '043 Patent Discloses the Best Mode for Sensor Electronics.

The patent itself and Marshall's deposition testimony establish that the '043 patent does not disclose a best mode for sensor electronics. At his deposition, Marshall acknowledge that there is not "any real discussion of the electronics in the '043 patent. (Marshall Depo. 14:21-22.) Indeed, the description of sensor electronics in the '043 specification is limited to the following:

> When the gamma rays interact in the gamma-ray detector 24, they produce electrical signals indicative of their energy. The sensor electronics 26 convert these electrical signals into digital information, which is transmitted over an interconnecting cable 28 to the display console 30. The display console 30 processes this information using the fact that neutron capture produces an energy [specturm] *spectrum* which depends on the amounts of the various elements capturing the neutrons. The result of this processing is information concerning the relative concentrations of the various elements of interest in the measurement volume 18 and any other properties, such as density, which may be usefully obtained from the measured spectrum.

('043 patent, col. 9, lines 29-42; '043 patent reexamination certificate, col. 3, lines 25-37.)

> The interface between the sensor electronics 26 and the display console 30 and the methods used therein also do not form a part of this invention.

('043 patent, col. 9, lines 42-45; '043 patent reexamination certificate, col. 3, lines 37-40.)

ASYS maintains that Marshall knew of a best mode for sensor electronics because he described his preferred embodiments for the sensor electronics in his notebooks and in a patent application filed six months before the '043 patent application. This patent application is United States Patent No. 4,152,596, entitled, "Apparatus for Reducing Pulse Pileup in an Elemental Analyzer Measuring Gamma Rays Arising from Neutron Capture in Bulk Substances." ("the '0596 patent") ASYS argues Marshall also failed to disclose that the sensor electronics component should perform the function of avoiding pulse-pileup in order to obtain accurate and

sensitive measurements of sample compositions. ASYS argues that Marshall described in the '596 patent application the preferred sensor electronics features needed to avoid "pulse pileup" in order to obtain accurate and sensitive measurements of sample compositions, but failed to describe those embodiments or reference the '596 patent application in the '043 patent application. (*See* '596 patent, col. 6, lines 30-36 (stating that the invention "has several features of novelty over the known prior art, including the use of specific techniques to improve the rejection of pulse pileup in an on-line elemental analyzer detecting neutron-capture gamma rays in order to increase measurement accuracy and reduce response time.")

Gamma-Metrics responds that there are triable issues of material fact as to whether Marshall considered the sensor electronics described in the '596 patent the best mode for practicing sensor electronics for the '043 invention.

Having carefully reviewed the evidence presented, the Court finds there are triable issues of material fact as to whether the '043 patent is invalid for failure to disclose best mode. Specifically, the Court finds there are triable issues of material fact as to whether, at the time of filing the '043 patent, Marshall considered the sensor electronics in the '596 patent the best mode for practicing the '043 invention. The Court finds there is also disputed evidence regarding whether the disclosure of sensor electronics is adequate to enable one of ordinary skill in the art to practice the best mode of the '043 invention. The Court will outline the disputed evidence regarding each of the prongs in the best mode analysis below.

1. The First Prong of the Best Mode Analysis: Whether Marshall Considered the Sensor Electronics Described in the '596 Patent the Best Mode.

Although ASYS characterizes Marshall's deposition testimony as admitting that the '596 patent disclosed the best mode for practicing sensor electronics, Gamma-Metrics states that Marshall's answers were somewhat equivocal. For example, when asked whether at the time of filing the '596 patent he believed the sensor electronics described in that patent were the best way of practicing the invention, Marshall responded, "This is the solution that I chose to describe in the patent. I think it was a good solution. Could there be a better one? Conceivably." (Marshall Depo. 13:19-22) The parties also cite the following exchange:

Q And when you wrote the 596 patent in July of 1977, were those the best electronics that you knew to use at that time with the PGNAA machine?

A I don't know about the word "best." The electronics that I conceived at that time.

Q Well, at that time were they the best ones you knew to use with this machine?

A Again, there are a number of constraints as to what you should do both from the standpoint of performance and also cost. This is the solution I came up with. Whether that is the best one, I don't know.

Q Maybe I didn't ask the question right. I just want to know in your own mind at that time when you filed this patent application describing the sensor electronics, were those the best sensor electronics that you knew about?

A That I don't totally recall. These are the electronics I described in the patent as a suitable solution to this problem.

(Marshall Depo. 12:2-20.)

ASYS characterizes this testimony as admitting that although he was unsure that he had arrived at the "absolute" best sensor electronics, the '596 sensor electronics was the solution he had come up with at the time he filed the '596 patent and the one contemplated for use with the '043 analyzers. In contrast, Gamma-Metrics characterizes this testimony as a indicative of the fact that Marshall did not contemplate any best mode for sensor electronics. In a declaration filed in support of Gamma-Metrics' opposition, Marshall states he "never considered the sensor electronics described in the '596 patent to be the best electronics for use with the bulk material analyzer described and claimed in the '043 patent." (Marshall Decl. ¶ 4.) He also states, "[w]hile I knew the '596 electronics would work in conjunction with the '043 invention, there were a number of constraints that I confronted during the development of the sensor electronics, not the least of which was cost. When I filed the application that became the '043 patent, I knew of many types of electronics suitable for use in a bulk material analyzer, and I did not consider any one of them the 'best.'" *Id.*

ASYS further supports its position by pointing out that in the bottom panel of Figure 2 of the '043 patent, the sensor electronics component is labeled "Sensor Electronics 26" and corresponds with the figure of the sensor electronics component in Figure 3 of the '596 patent that is entitled: "Block diagram — Sensor Electronics 26." ASYS points out that at his deposition, Marshall admitted that the sensor electronics which he had in mind for the analyzers

claimed in the '043 patent were the sensor electronics he wrote in the '596 patent:

> Q Okay. When you wrote the '043 patent that's Exhibit 1, did you have in mind the same sensor electronics as you had in mind when you wrote the '596 Exhibit 2 patent?
>
> A Basically.

(Marshall Depo. 9:7-11.)

> Q So you knew at least at the time of filing the 043 patent that you wanted sensor electronics much like in the 596 patent, isn't that true?
>
> A In general terms, yes.

(Marshall Depo. 52:10-13.)

At the summary judgment stage, the Court cannot make determinations of credibility or weigh the evidence; rather, these are functions for the factfinder at trial. *See Anderson*, 477 U.S. at 255. Whether the evidence presented — Marshall's notebooks, the '596 patent, and Marshall's deposition testimony — establish that Marshall believed that the sensor electronics described in the '596 patent were the best mode for sensor electronics to practice the '043 invention is an issue that requires weighing of the evidence. In addition, whether Marshall's deposition testimony should be characterized as admitting or denying this issue is a matter that requires the factfinder to engage in credibility determinations, particularly in light of Marshall's declaration denying he believed the '596 sensor electronics were the best mode sensor electronics for the '043 patent.[2] Accordingly, because of the disputed evidence raised and the weighing of the evidence required, the Court finds summary judgment inappropriate on this issue.

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[2] ASYS contends this Court should give Marshall's declaration little weight as it is a "sham" declaration. Because Marshall's deposition testimony can be characterized as being somewhat equivocal, the Court does not find the declaration completely contravenes his prior testimony such that it should be stricken as a sham declaration. *See Cleveland v. Policy Management Sys. Corp.*, 526 U.S. 795, 806-07 (1999) (noting that courts have held that a party cannot create a genuine issue of material fact sufficient to survive summary judgment by contradicting his or her own previous sworn testimony). Rather, whether Marshall's declaration should be disregarded as being contrary to his deposition testimony is a credibility issue that is reserved for the trier of fact. *See Anderson*, 477 U.S. at 255.

2. The Best Mode's Second Prong: Whether the '043 Patent's Disclosure is Adequate to Enable one of Ordinary Skill in the Art to Practice the Best Mode.

Even though the existence of genuine issues of material fact regarding Marshall's state of mind render it unnecessary for the Court to analyze whether the second prong of the best mode test, the Court will briefly discuss the evidence presented because it bolsters the Court's finding that summary judgment is inappropriate. In *Transco*, 38 F.3d at 561-62, the Federal Circuit found that summary judgment was inappropriate where there is conflicting evidence regarding whether a specification provides adequate disclosure of the best mode for practicing the invention. This case presents conflicting evidence.

On the one hand, ASYS argues that because Marshall failed to provide any description of the sensor electronics or even state that pulse pileup rejection is a desirable function of the sensor electronics, what was known to one of ordinary skill in the art is irrelevant. In addition, ASYS has presented the declaration of its expert who opines that the '043 patent's disclosure of the existence of a sensor electronics unit is not sufficient for one of ordinary skill in the art to duplicate the best mode sensor electronics without undue experimentation. (Gardner Decl. ¶ 36.)

Gamma-Metrics notes that ASYS's expert, Robin P. Gardner, Ph.D., testified at the tutorial hearing that the "education background and experience of one of ordinary skill in the art in the field of the '043 patent in 1978" was "a Ph.D. in nuclear engineering or nuclear physics, and a year of experience in a neutron analysis area." (Tutorial Transcript ("Tut. Tr.") at 46:2-7.) In contrast with ASYS's evidence, Gamma-Metrics has presented evidence indicating that anyone skilled in the art would know about the electronics for gamma ray detection. (Lanza Decl. ¶ 12.) In addition, Gamma-Metrics' expert states that pulse pileup is a problem that was well known to those skilled in the art in 1977 "and a variety of circuits generally referred to as pileup rejecters had been devised to obviate this problem." *Id.* Gamma-Metrics' expert, Richard C. Lanza, Ph.D., also states that at the time, pileup rejection techniques had been commercially available for many years. *Id.* Gamma-Metrics further cites publications of ASYS's expert, Dr. Gardner, whose 1977 publication "A Generalized Method for Correcting

Pulse-Height Spectra for the Peak Pile-Up Effect Due to Double Sum Pulses," concerned pulse pileup rejection. (Brooks Decl. Exhs. 6, 7.)

In sum, the Court finds that the conflicting evidence regarding the adequacy of disclosure precludes summary judgment.

3. Summary.

ASYS's burden in proving invalidity at the summary judgment stage requires it to show with clear and convincing evidence that the patent is invalid for failure to disclose best mode. In addition to this high standard, it is important to note that the best mode analysis is a fact-intensive inquiry that requires in part, consideration of the intent of the inventor at the time of filing the patent application. The best mode requirement also requires consideration of what was known to those skilled in the art. The evidence before the Court on these issues is conflicting. Accordingly, summary judgment is inappropriate and ASYS's motion for summary judgment is **DENIED** as to the sensor electronics issue.

IV. Best Mode - Neutron Reflectors.

ASYS argues that the '043 patent is invalid for failing to disclose the best mode dimensions for the neutron reflectors needed to achieve uniformity of response. ASYS states that the claims of the '043 patent require a neutron-reflecting substance in the measurement area of the claimed analyzer so as to increase efficiency of neutron use. ('043 patent claim 4(a), '043 patent reexamination certificate, col. 2, lines 22-24.) The patent also suggests the using bismuth, beryllium, carbon, and oxygen as neutron reflectors. ('043 patent claim 4(a), '043 patent reexamination certificate, col. 2, lines 22-24.) The '043 patent, however, does not disclose any reflector dimensions for neutron reflectors. (Proctor Depo. at 30:5-31:10.)

A. Whether Marshall Contemplated a Best Mode for Neutron Reflectors.

ASYS argues that the evidence is clear that Marshall had calculated and tested bismuth reflector dimensions which could give rise to greater uniformity of response, yet failed to disclose those dimensions in the '043 patent. Because the '043 patent does not give sufficient guidance as to the specific function that the bismuth is serving in the analyzer, or what increase in uniformity of response is desired, it would have been impossible for one of ordinary skill in

the art to determine the best mode reflector dimensions which Marshall knew but failed to disclose in the '043 patent. Therefore, ASYS argues the '043 patent is invalid for failing to disclose the best mode reflector dimensions.

In a declaration filed during the '043 patent's reexamination proceedings, Marshall stated that the bismuth shield, which acted also as a neutron reflector, was a feature of the patented analyzer. ('043 File History, at 000485-86.) ASYS contends that at the time Marshall filed the '043 patent, he had obtained calculations to determine the dimensions for the bismuth reflector needed to improve sensitivity of measurement and uniformity of neutron flux and response, and the dimensions known to Marshall were written on drawings for a conceptual bulk material analyzer. In support for its argument that at the time of filing the '043 patent application Marshall was aware of dimensions for the bismuth reflectors that he believed would give the best uniformity of response, ASYS cites Marshall's Supplemental Declaration filed during the reexamination proceedings. ('043 File History, at 000804-10; Proctor Depo. at 20:3-21:13.) ASYS states that Allen Cekorich performed calculations on March 16, 1977 which calculated flux and sensitivity and these calculations were recorded in Marshall's notebook. ('043 File History, at 000811; Proctor Depo. at 20:3-21:13.) ASYS further argues that at his deposition, Marshall admitted he had done some confirming tests to indicate that the calculations were accurate, and that the conceptual bulk material analyzer for carrying out tests for improved uniformity of sensitivity was actually constructed six months before the '043 patent application was filed. ('043 File History at 000809.) The bismuth thickness Marshall used in his experimental set-up was 2 to 2½ inches, and this was the same thickness of bismuth used in the analyzer produced as a result of Marshall's work on that project. (Proctor Depo. at 20:3-9; '043 File History, at 000805-07.) Thus, ASYS argues, at the time of the filing, Marshall knew of the dimensions for the bismuth neutron reflectors that he believed would give the best uniformity of response.

The Court agrees with Gamma-Metrics that there are genuine issues of material fact as to whether Marshall considered bismuth of certain dimensions the best mode for neutron reflectors. First, as Gamma-Metrics points out, ASYS has not presented any evidence from Marshall's

deposition testimony where Marshall testified regarding his state of mind on bismuth and its thickness. (*See* Marshall Depo.) Rather, ASYS relies on evidence regarding Marshall's experimental set-up or prototype. In *Wahl Instruments, Inc. v. Acvious, Inc.*, the Federal Circuit noted that use of particular materials in production may be chosen for "non-best mode" reasons. 950 F.2d 1575, 1581 (Fed. Cir. 1991). Thus, Marshall's use of bismuth when constructing an experimental set-up or prototype does not necessarily compel the conclusion that his choice of materials was based on a belief that bismuth, and a particular thickness of bismuth is the best mode for neutron reflection. Marshall's declaration submitted in support of this opposition also refutes ASYS's allegations. (Marshall Decl. ¶ 5.) Marshall states, "[w]hen I filed the '043 application, I did not consider bismuth to be the best neutron reflector for use with my invention. Other elements, such as beryllium, oxygen, deuterium, and carbon all had suitable neutron reflecting properties." *Id.* Gamma-Metrics also contends that the patent itself indicates that Marshall did not consider bismuth the best neutron reflector. The '043 patent lists, in addition to bismuth, other elements that serve as good neutron reflectors, such as beryllium, oxygen, deuterium, and carbon. ('043 patent col. 7, lines 14-17; '043 patent reexamination certificate, col. 3, line 67-col. 4, line 4.)

The Court finds that ASYS has not provided clear and convincing evidence showing that Marshall contemplated bismuth, and a particular thickness of bismuth, to be the best mode neutron reflector. In light of the absence of deposition testimony or admissions specifically indicating that at the time Marshall considered bismuth of a certain thickness to be the best mode, Marshall's declaration creates a triable issue of material fact on this point.[3] Further, as noted above, there are other possible explanations for why Marshall used bismuth in his experimental prototype. Accordingly, the Court finds that summary judgment is inappropriate.

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[3] Gamma-Metrics again requests the Court to consider Marshall's declaration a "sham." But in the absence of any directly contradictory admission, such as in deposition testimony, the Court finds whether Marshall's declaration is persuasive is a credibility matter that is reserved to the trier of fact.

B. Whether One of Ordinary Skill in the Art Would Have Known How to Calculate the Thickness of Bismuth.

Even though the existence of genuine issues of material fact regarding Marshall's state of mind render it unnecessary for the Court to analyze whether the second prong of the best mode test, the Court will briefly discuss the evidence presented because it bolsters the Court's finding that summary judgment is inappropriate as to whether the '043 patent is invalid for failing to disclose bismuth of certain dimensions for use as neutron reflectors. *See Transco*, 38 F.3d at 561-62.

ASYS argues that one of ordinary skill in the art could not have determined the best mode dimensions for a bismuth reflector based on the disclosure in the '043 patent without undue experimentation. In support, ASYS cites the deposition testimony of Gamma-Metrics' scientist, Raymond J. Proctor, who discussed the difficulty in achieving uniformity of response, and the importance of knowing the properties of the reflectors and their thickness to achieve uniformity of response. Specifically, ASYS cites the following exchange:

Q What do you mean by that?

A It is difficult to make a uniform response. You have to work at it.

Q Even with the neutron reflectors?

A Yes.

Q What do you mean, "you have to work at it"?

A You have to judiciously use reflectors and positioning of source detectors to achieve uniformity.

Q So it is important to know where the sources are, what reflectors you're using, and where the reflectors are in order to achieve uniformity?

A Correct.

Q And that means you need to know the properties of the reflectors and how thick they are in order to achieve uniformity?

A Yes.

Q And none of that is described in the '043 patent, is it?

A It does not teach the mechanics of that, yes.

(Proctor Depo. at 34:2-20.)

ASYS contends the '043 patent does not quantify what increase in uniformity of response is sought, or what increase of response is obtained by using the bismuth reflectors described in the preferred embodiment in the '043 patent. (Proctor Depo. at 36:11-18.) In addition, the drawings in the '043 patent are presumed to not be drawn to scale and may not be relied upon to show particular sizes if the specification does not disclose the dimensions. *Hockerson-Halberstadt Inc. v. Avia Group Int'l, Inc.*, 222 F.3d 951, 956 (Fed. Cir. 2000). ASYS also argues that the bismuth in the claimed analyzer serves several multiple functions and this, coupled with the absence of a definition of the increase in uniformity of response sought to be achieved, it would have been impossible for one of ordinary skill to determine which criteria would be used to select the dimensions of the bismuth or to arise at the same "best mode" dimensions Marshall used.

ASYS further points out that during the [reexamination proceedings] Marshall asserted that he was the first to use neutron reflectors in bulk material analyzers. ('043 File History, at 00811-12.) Thus, ASYS argues, Gamma-Metrics cannot argue that there would have been guidance for one of skill in the art in selecting such a reflector for use in a bulk material analyzer.

Gamma-Metrics responds with evidence suggesting that one skilled in the art would know how to calculate an appropriate reflector thickness for a bismuth reflector. For example, Dr. Gardner testified at the tutorial that one of ordinary skill in the art in the field of the '043 patent in 1978 would have a Ph.D. in nuclear engineering or nuclear physics, and a year of experience in the neutron analysis area. (Tut. Tr. 46:2-7.) In addition, Gamma-Metrics' PGNAA engineer, Michael Hurwitz, testified in his deposition that one skilled in the art would know how to calculate thickness for neutron reflectors. (Hurwitz Depo. 91:22-93:10.) Further, Dr. Lanza has submitted a declaration stating that one skilled in the art would be able to apply well-known mathematical formulas to calculate reflector thickness for any particular application. (Lanza Decl. ¶ 15.)

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Under *Transco*, the conflicting evidence regarding whether one of ordinary skill in the art would have know how to calculate an appropriate reflector thickness precludes summary judgment on this issue. *See Transco*, 38 F.3d at 561-62.

COLLATERAL ESTOPPEL

Although the Court found it unnecessary to construe claim 4(c) of the '043 patent for purposes of this motion, the Court notes that the parties raised an issue in their discussions of claim construction that warrants discussion at this time. Specifically, the issue is whether Gamma-Metrics is collaterally estopped from presenting claim construction arguments in light of the *Scantech* action.

ASYS states that the Federal Circuit has held that collateral estoppel can preclude a patentee from relitigating claim construction decided in an earlier lawsuit between the patentee and another defendant, citing in support *Molinaro v. Fannon Courier Corp.*, 745 F.2d 651 (Fed. Cir. 1984). There, the Court stated, "where a determination of the scope of patent claims was made in a prior case, and the determination was essential to the judgment there on the issue of infringement, there is collateral estoppel in a later case on the scope of such claims, *i.e.*, the determined scope cannot be changed." *Molinaro*, 745 F.2d at 655. Here, Judge Huff construed claim 4(c), and that claim was not amended during reexamination of claim 4. The *Scantech* action has now settled. ASYS states that notwithstanding the settlement, Judge Huff's construction of claim 4(c) should be given preclusive effect.

Gamma-Metrics responds it is not collaterally estopped from arguing construction of claim 4(c) because it was not afforded a full and fair opportunity to litigate the construction of claim 4(c). In support, Gamma-Metrics argues that because it won on its claim of patent infringement in the prior action, it could not appeal Judge Huff's construction of claim 4(c). Gamma-Metrics also contends that in *Scantech*, the parties and court focused almost entirely on claim 4(a), and claims 4(b) and 4(c) were not contested, and therefore Judge Huff's construction of claim 4(c) was not essential to the judgment of infringement against Scantech.

The Court agrees with Gamma-Metrics that under the circumstances, it is not collaterally estopped from presenting claim construction arguments. "'Under collateral estoppel, once a

court has decided an issue of fact or law necessary to its judgment, that decision may preclude relitigation of the issue in a suit on a different cause of action involving a party to the first case.'" *Hydronautics v. Filmtec Corp.*, 204 F.3d 881, 885 (Fed. Cir. 2000) (*quoting Dodd v. Hood River County*, 59 F.3d 852, 863 (9th Cir. 1995)). Federal law establishes that collateral estoppel applies where:

> "(1) the issue is identical to one decided in the first action; (2) the issue was actually litigated in the first action; (3) resolution of the issue was essential to a final judgment in the first action; and (4) plaintiff had a full and fair opportunity to litigate the issue in the first action."

In re Freeman, 30 F.3d 1459, 14665 (Fed. Cir. 1994); *A.B. Dick Co. v. Burroughs Corp.*, 713 F.2d 700, 702 (Fed. Cir. 1983).

In the patent litigation context, issue preclusion or collateral estoppel "has obtained a unique significance after *Markman v. Westview Instruments, Inc.*, 517 U.S. 370 (1996). *Graco Children's Products, Inc. v. Regalo International, LLC*, 77 F. Supp. 2d 660, 662 (E.D. Pa. 1999). In *Markman*, the Supreme Court stated that it saw "the importance of uniformity in the treatment of a given patent as an independent reason to allocate all issues of construction to the court." *Markman*, 517 U.S. at 390; *Graco*, 77 F. Supp. 2d at 662-63. Prior to *Markman*, the Federal Circuit had held in *Jackson Jordan, Inc. v. Plasser American Corp.*, 747 F.2d 1567 (Fed. Cir. 1984) that collateral estoppel does *not* apply "where a plaintiff has won a lawsuit on infringement, but believes a claim at issue was too narrowly construed and, having won, has no reason to appeal." *Graco*, 77 F. Supp. 2d at 663; *see Jackson Jordan*, 747 F.2d at 1577-78.

There is no Federal Circuit case discussing how collateral estoppel applies to claim construction rulings in light of *Markman*. Unfortunately, there is not a consensus among the district courts. In *TM Patents v. IBM Corp.*, 72 F. Supp. 2d 370 (S.D.N.Y. 1999), the Southern District of New York held that a claim construction decision has a binding effect despite a subsequent settlement before appeal. *TM Patents*, 72 F. Supp. 2d at 374-77. In so holding, the court analyzed *Markman* and other cases that emphasized the need to promote uniformity in the meaning to be given a particular patent's claims. *Id*; *Abbott Labs v. Dey, L.P.*, 110 F. Supp. 2d 667, 670 (N.D. Ill. 2000).

In contrast, in *Graco*, the Honorable Robert F. Kelly of the Eastern District of Pennsylvania held that *Markman* "did not guarantee that collateral estoppel would apply in every case" and declined to interpret *Markman* to mean that collateral estoppel should apply without consideration of the particular circumstances presented by a particular action. In *Graco*, the plaintiff had won an earlier patent infringement suit but had lost on a claim interpretation issue. *Graco*, 77 F. Supp. 2d at 661-62, 664. The earlier action eventually settled, and the *Graco* case was a new patent infringement suit. Judge Kelly held that collateral estoppel did not apply to preclude the plaintiff from arguing for its interpretation of the claim because the settlement precluded the plaintiff from appealing the earlier action's claim construction. *Graco*, 77 F. Supp. 2d at 664. In so holding, the court noted Federal Circuit cases holding that application of collateral estoppel to a claim interpretation issue decided in a prior infringement action required that "the interpretation of the claim had to be the reason for the loss [in the prior case] on the issue of infringement." *Id.* (internal quotations omitted). In *Graco*, the plaintiff did not lose the previous litigation but rather had won a jury verdict in its favor, thereby "making the court's interpretation of the term within the patent claim not essential to the final judgment in that case." *Id.* *Graco* also noted that granting preclusory effect to claim construction would encourage more appeals and discourage settlement. *Id.*

The Court finds the reasoning in *Graco* persuasive and adopts it in this case. The Court agrees with both *TM Patents* and *Graco* that the need to promote uniformity in the construction of claims weighs in favor of applying collateral estoppel. But the Court is not persuaded that the importance of uniformity is so significant that it outweighs all other factors considered when applying collateral estoppel. In this regard, the Court finds that *Graco*'s consideration of additional circumstances before determining whether to apply collateral estoppel is more consistent with the doctrine of collateral estoppel generally. As *Graco* noted, the Restatement (Second) of Judgments § 28 provides for an exception to the general rule of collateral estoppel where the party against whom preclusion is sought could not, as a matter of law, have obtained review of the judgment in the initial action. *Graco*, 77 F. Supp. 2d at 664 (*citing* Restatement (Second) Judgments § 28(1).) Here, because the *Scantech* action has settled, Gamma-Metrics

did not have an opportunity to appeal Judge Huff's construction of the '043 patent's claims. Thus, as *Graco* recognized, applying collateral estoppel to claim construction in such circumstances will discourage settlement and encourage appeals. *Graco*, 77 F. Supp. 2d at 664. Accordingly, the Court finds that Gamma-Metrics is not collaterally estopped from presenting claim construction arguments.

CONCLUSION

For the foregoing reasons, having carefully considered the parties' briefs and argument of counsel, applicable law, and good cause appearing, **IT IS HEREBY ORDERED** that ASYS's motion for summary judgment based on failure to disclose best mode is **DENIED**.

IT IS SO ORDERED.

Dated: 3/29/01

M. JAMES LORENZ
UNITED STATES DISTRICT JUDGE

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